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Patent Assignee: TOYODA MACHINE WORKS LTD

Author (Inventor): KAWAMURA JUNICHI

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(71)出願人 000003470

豊田工機株式会社

愛知県刈谷市朝日町1丁目1番地

(72)発明者 川村 淳一

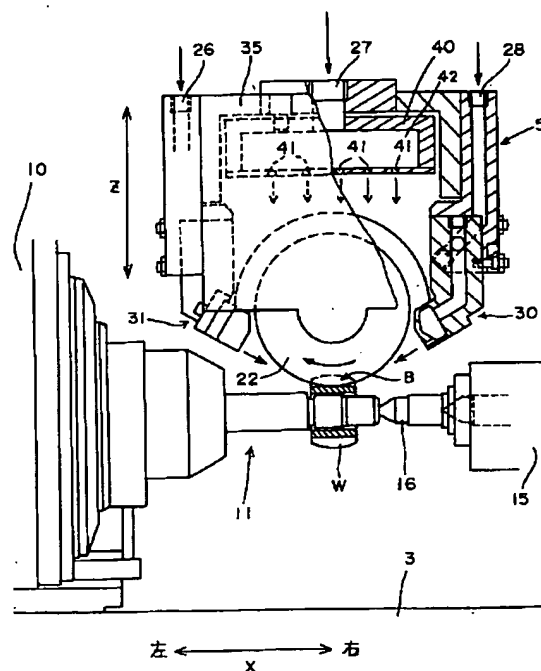
愛知県刈谷市朝日町1丁目1番地 豊田工
機株式会社内

(54)【発明の名称】 溝加工装置

(57) 【要約】

【目的】等速ジョイントのインナーレース等の溝研削における研削液の供給不足による研削焼け、砥石車22の寿命の低下を防止するための研削点付近に多量の研削液を供給し、かつ、砥石の高速回転により発生される空気流を遮断してより研削液の供給を高める。

【構成】砥石車２の左右両側より研削点８へ研削液を供給する研削液供給ノズル３０、３１と上方から研削液を砥石車２に噴射させ空気流の遮断をする研削液噴射装置４０とを備えた溝加工装置。



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【特許請求の範囲】

【請求項1】 等速ジョイントのインナーレース等のワークの円周上に溝を研削する溝加工装置において、砥石台に軸承されワークの円周上に溝を研削する砥石車と、前記砥石台に設置され研削点の両側より研削液を研削点に向けて噴射する複数の研削液供給ノズルと、前記砥石車の上方より砥石車に向けて研削液を噴射する研削液噴射装置とを備えたことを特徴とする溝加工装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、等速ジョイントのインナーレース等のワークの円周上に溝を研削する溝加工装置に関するものである。

【0002】

【従来の技術】従来の溝加工装置においては、図4および図5に示すように外周が円弧状の砥石車51を切込み量だけ下降させるとともに、ワークWを左から右へと低速で送り、1パスでワークWの外周面に溝50を研削するクリープフィード研削が行われる。この際砥石車22の右側の外周に設置された研削液供給ノズル52より研削点に向けて研削液が供給されている。

【0003】

【発明が解決しようとする課題】上記の従来において溝の研削は、仕上げ面粗さおよび精度低下の少ないクリープフィード研削を採用している。よって、1パス研削のため切込み量が多く、また、溝50により砥石車22が囲まれるため研削点への研削液の供給がされにくい。また、研削温度が高くなり研削焼けを起こすことがある。さらに、砥石の高速回転により砥石の円周上に空気流が発生して研削点への研削液の供給を妨げてしまいなおさら研削焼け、砥石車の寿命の低下を起こしやすく、研削精度を悪くする恐れがあった。

【0004】

【課題を解決するための手段】本発明は上記の課題を解決するためになされたものであり、砥石台に軸承されワークの円周上に溝を研削する砥石車と、前記砥石台に設置され研削点の両側より研削液を研削点に向けて噴射する複数の研削液供給ノズルと、前記砥石車の上方より砥石車に向けて研削液を噴射する研削液噴射装置とを備えたものである。

【0005】

【作用】砥石台に設置された研削液供給ノズルより研削点に両側から研削液が噴射される。また、研削液噴射装置により砥石車に向けて多量の研削液が勢いよく噴射されることで高速回転される砥石車により発生する空気流が遮断されることで、より一層研削点への研削液の供給性が良くなる。また、研削液供給装置より噴出された研削液は砥石車に付着して研削点にまでつれまわる。そして、砥石車によりワークの溝が研削される。

【0006】

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【実施例】本発明の実施例について図1、図2および図3を用いて説明する。1はベッドであり、このベッド1上にはサーボモータ2により左右のX方向に移動されるテーブル3が設置されている。このテーブル3上には主軸頭10および心押台15が対向設置されており、前記心押台15には図略のシリンダによりX方向に進退可能にセンタ16が支持されている。

【0007】前記主軸頭10の心押台15側の端面にはワークWをその内径より保持するチャック11が固定されている。前記ベッド1上には、縦形にコラム20が固定されている。このコラム20の前記テーブル3側には、上下のZ方向に移動可能に移動板21が支持されている。前記移動板21には砥石台5が固定されており、この砥石台5に砥石車22が軸承されている。この砥石車22は図5に示すようにワークWにU字形の溝50を研削するため外周部は円弧状をしている。

【0008】そして、前記砥石車22の上面、両側面および前後面と覆って砥石カバー35が砥石台5に固定されている。前記砥石カバー35には、上方より図略のパイプにより研削液が供給される3カ所の研削液供給口26、27、28が形成されている。また、前記砥石車22の円周上の左右の2方向から砥石車22の研削点8へと開口部を向けた研削液供給ノズル30、31が前記砥石カバー35両側部に取り付けられている。

【0009】さらに前記砥石カバー35内の上部には、前記砥石車22へと研削液を噴射する研削液噴射装置40が固定されている。この研削液噴射装置40は前記研削液供給口27からの研削液がたまる部屋42のある箱型をしており、下面の砥石車22側には部屋42から研削液が噴出するための小さな噴射孔41が砥石車22の径方向および幅全体に向けて多数開けられている。

【0010】上記した構成についての動作を以下に説明する。ワークWがチャック11により内面より保持され、センタ16が心押台15よりせり出しチャック11の軸端が支持される。そして砥石車が高速回転し、砥石台5が所定の切込み量だけ下降され、テーブル3が左から右に送られて1パスでワークWの外周面に溝50を研削するクリープフィード研削がおこなわれる。

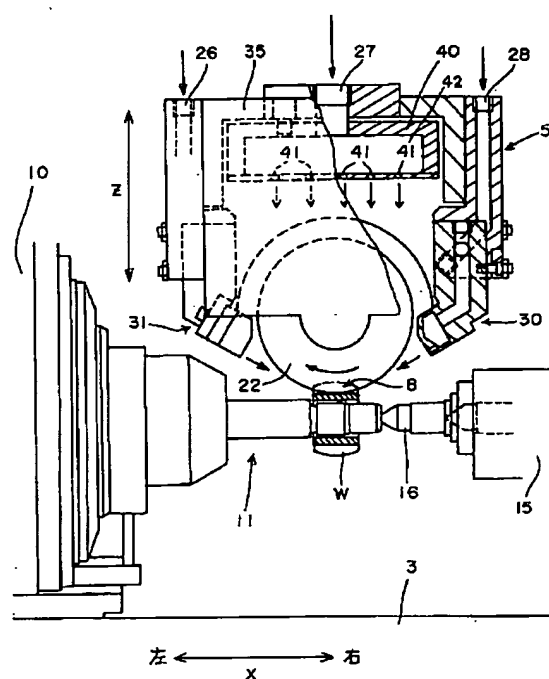
【0011】この際、3カ所の研削液供給口26、27、28からは高圧な研削液が供給される。つまり研削液供給口26、28からの研削液は、それぞれ研削液供給ノズル30、31より研削点8に向けて左右両側から放出される。また、研削液供給口27からの研削液は、研削液噴射装置40の部屋42より研削液噴射孔41を通して砥石車22に向けて噴出される。すると、図3に示すように砥石車22の高速回転により発生する空気流45は噴出される研削液46により次第に遮られ、最も遮断力の大きい直角方向からの研削液ではすべての空気流45が遮断される。また、その後には発生する空気流も噴出される研削液46により遮断される。よって前記研

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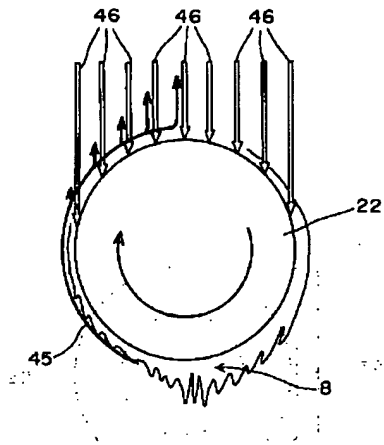
40 研削液喷射装置

【発明の効果】以上述べたように本発明によれば、砥石車の両側から研削液供給ノズルにより研削液を供給することで等速ジョイントのインナーレース等の溝研削において十分なる研削液を研削点に供給することができ、かつ、研削液噴射装置により砥石車に研削液を高圧で噴出させて空気流の遮断をすることで、より研削液供給ノズル

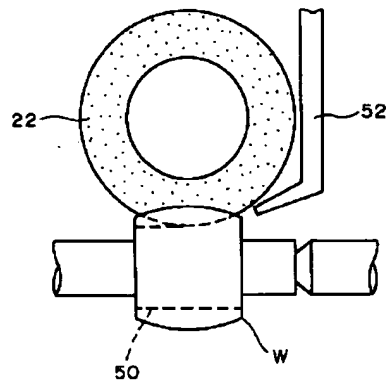
【図2】



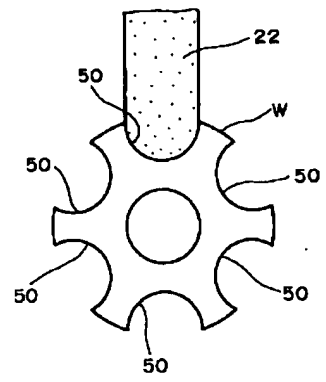
【図3】



【図4】



【図5】



Searching by Document Number

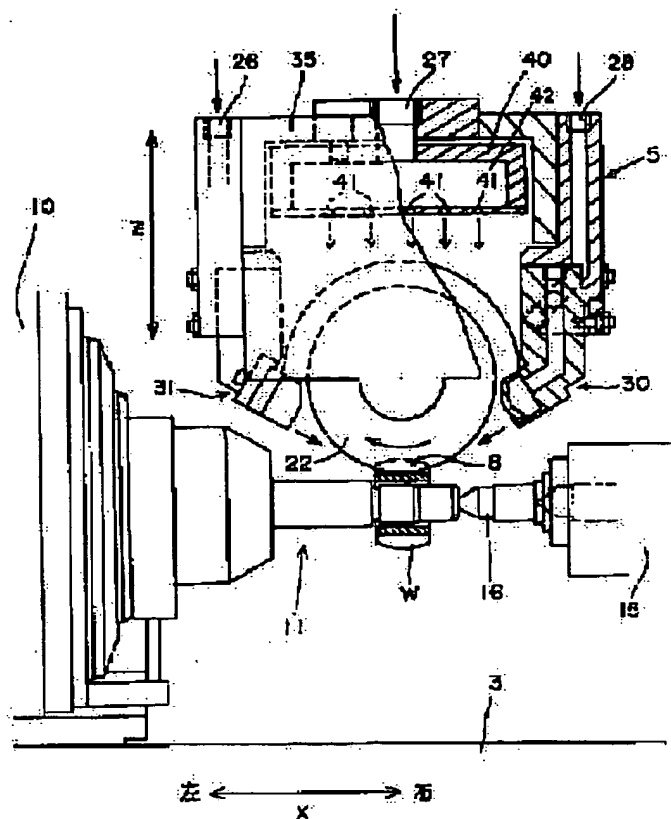
** Result [Patent] ** Format(P803) 26.Sep.2003 1/ 1

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Registration no/date: []
Examined publication date (present law): []
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PCT publication no/date []
Applicant: TOYODA MACH WORKS LTD
Inventor: KAWAMURA JUNICHI
IPC: B24B 19/02 B24B 55/02
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F-term: 3C047FF09, GG01, 3C049AA03, AC04, CA01, CB02, CB03, CB05
Expanded classification: 252
Fixed keyword:
Citation:
Title of invention: GROOVE PROCESSING DEVICE
Abstract:

PURPOSE: To feed plenty of grinding liquid to near the grinding position so as to prevent a grinding burning owing to the shortage of feeding grinding liquid in the groove grinding of the inner race or the like of a constant velocity joint, and lowering of service life of a grinding wheel, and to cut off the air flow generated by the high speed rotation of the grinding wheel so as to increase the feeding of the grinding liquid.

CONSTITUTION: This groove processing device is provided with grinding liquid feeding nozzles 30 and 31 to feed the grinding liquid to the grinding position 8 from the left side and the right side of a grinding wheel 22, and a grinding liquid injection device 40 to inject the grinding liquid to the grinding wheel 22 from the upper side so as to cut off the air flow.

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Priority country/date/number: () [] ()
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*** Trial no/date [] Kind of trial [] ***
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 Opponent: -
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Amount of annuities payment: year
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Other Drawings...

Patent/ public disclosure document

1994039699

[Abstract(made by the applicant)] [Claims] [Detail Description] [Drawing Description]

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(57)

[ABSTRACT]**[PURPOSE]**

Air stream grinding fluid of mass is supplied in the vicinity of grinding point to prevent grinding burning by feed shortage of grinding fluid in bezel grinding of inner races of equal speed joint, fall of generation time of emery wheel 22 and it is occurred by high speed revolution of grind stone is intercepted, and it depends, and feed of grinding fluid is raised.

[CONSTITUTION]

The recessing apparatus which it made emery wheel 22 jet grinding fluid from grinding fluid feed branch 30 which supplied a grinding fluid to grinding point 8 from right and left both sides of emery wheel 22, 31 and top, and comprised grinding fluid fuel injection system 40 to intercept after the fashion of air.

[WHAT IS CLAIMED IS:]**[Claim 1]**

In recessing apparatus grinding bezel on circumference of work of inner races of equal speed joint; Recessing apparatus; comprising: The emery wheel which it is jikusyosa by a wheel-spindle stock, and grind bezel on circumference of work, Grinding fluid feed branch of the complement that it is installed in said wheel-spindle stock, and grinding fluid is turned to grinding point from both sides of grinding point, and * syasuru, The grinding fluid * sya apparatus that it is turned to emery wheel than top of said emery wheel, and * syasuru grinding fluid.

[DETAILED DESCRIPTION OF THE INVENTION]**[0001]****[INDUSTRIAL APPLICATION FIELD]**

The present invention relates to recessing apparatus grinding bezel on circumference of work of inner races of equal speed joint.

[0002]**[PRIOR ART]**

In conventional recessing apparatus, only an infeed makes drop with emery wheel 51 which is arcuate contour as shown in figure 4 and figure 5, and creep feed grinding grinding bezel 50 is done in feed, one pass at low speed from left to right in work W by outer circumferential surface of work W. In doing so, it is turned to grinding point than grinding fluid feed branch 52 installed circumferentially of the right side of emery wheel 22, and grinding fluid is supplied.

[0003]**[PROBLEM TO BE SOLVED BY THE INVENTION]**

Grinding of bezel adopts roughness of finished plane and a little creep feed grinding of accuracy drop in before. Get together, Because feed of grinding fluid to grinding point is hard to be done so that emery wheel 22 is surrounded by a lot of infeeds and gash 50 for one pass grinding, grinding temperature becomes high, and there can be the thing that grinding burning is waked up. To a countersunk head, Air stream occurs on circumference of grind stone by high-speed revolution of grind stone, and feed of grinding fluid to grinding point is disturbed, and grinding burning, fall of generation time of emery

wheel are easy to be waked up all the more, it might do grinding accuracy badly.

[0004]

[MEANS TO SOLVE THE PROBLEM]

The present invention is achieved to solve the assignment, the grinding fluid * *sya* apparatus that is installed in the emery wheel which is jikusyosa by a wheel-spindle stock, and grind bezel on circumference of work and the wheel-spindle stock, and grinding fluid is turned to grinding point from both sides of grinding point, and * is turned to emery wheel than top of grinding fluid feed branch of a complement to syasuru and the emery wheel, and * syasuru grinding fluid is comprised.

[0005]

[OPERATION]

It is shone at grinding point * grinding fluid than a grinding fluid feed discharge jet installed in a wheel-spindle stock by both sides. In addition, The air stream that grinding fluid * is shot, and it sookini, and it depends, and it is turned to emery wheel, and grinding fluid of mass occurs by the * emery wheel that it is rotated high speed because it is shone like a brick is what is intercepted, and feed characteristics of grinding fluid to grinding point improve still more. In addition, Grinding fluid spouted out than grinding fluid feeder bonds to emery wheel, and it is taken in grinding point, and it turns around. And, Bezel of work is ground by emery wheel.

[0006]

[EXAMPLE]

Embodiment of the present invention is explained by means of FIG. 1, figure 2 and figure 3. 1 is bed, and table 3 moved with servomotor 2 by a X-direction of right and left is installed on this bed 1. Facing on this table 3, and is installed, the advance or retreat is possible, and center 16 is supported to a X-direction to tail stock 15 with a cylinder of figure abbreviation.

[0007]

Chuck 11 holding work W than the bore diameter is fixed to an end of tail stock 15 side of milling head 10. On bed 1, column 20 is fixed to form long. An upper and lower Z-direction can be moved to, and, in table 3 side of this column 20, move board 21 is supported. Wheel-spindle stock 5 is fixed to move board 21, emery wheel 22 is jikusyosa to this wheel-spindle stock 5. As for this emery wheel 22, outer perimeter has a configuration of a circular arc to grind U-shaped bezel 50 in work W as shown in FIG. 5.

[0008]

And, It overturns with the top of emery wheel 22, a sides and an ex-rear face, and grind stone jacket 35 is fixed to wheel-spindle stock 5. To grind stone jacket 35, three places of grinding fluid feed hopper 26 that grinding fluid is supplied, 27, 28 are formed than top by pipe of figure abbreviation. In addition, Grinding fluid feed branch 30 which turned opening from two direction of right and left in circumference of emery wheel 22 to grinding point 8 of emery wheel 22, 31 are installed in 35 grind stone jacket sides.

[0009]

Even more particularly, in top in grind stone jacket 35, grinding fluid * *sya* apparatus 40 that * syasuru grinding fluid is fixed to emery wheel 22. This grinding fluid * *sya* apparatus 40 does box mold with chamber 42 which grinding fluid from grinding fluid feed hopper 27 collects, small * *sya* aperture 41 for grinding fluid to do * from from chamber 42 in 22 emery wheel side of underside turns to a diametrical direction of emery wheel 22 and the whole amplitude, and is opened mass.

[0010]

Action on the described above assembling is explained in the following. Work W is held than inner surface with chuck 11, axis end of stage elevator chuck 11 is supported than tail stock 15 center 16. And emery wheel rotates high speed, is dropped only the infeed that wheel-spindle stock 5 is predetermined, table 3 is sent to right by left, and creep feed grinding grinding bezel 50 is done in one pass by outer

circumferential surface of work W.

[0011]

In doing so, The grinding fluid which is elevated pressure is supplied from three places of grinding fluid feed hopper 26, 27, 28. In other words grinding fluid feed hopper 26, a grinding fluid from 28 turn to grinding point 8 than grinding fluid feed branch 30, 31 respectively, and it is ejected by right and left both sides. In addition, A grinding fluid from grinding fluid feed hopper 27 turns to emery wheel 22 through grinding fluid * sya aperture 41 than chamber 42 of grinding fluid * sya apparatus 40, and it is started *. Then, It is up to, and occurring air stream 45 is obstructed by grinding fluid 46 spouted out as shown in FIG. 3 by high-speed revolution of emery wheel 22, all air stream 45 is intercepted in grinding fluid from big right angle direction of cutoff force most. In addition, The air stream occurring later is intercepted by grinding fluid 46 spouted out. Therefore, grinding fluid feed branch 30, a grinding fluid from 31 are supplied in grinding point without it being disturbed after the fashion of air. Besides, Grinding fluid 46 from the grinding fluid fuel injection system is turned to all emery wheel 22 without being scattered outside so that it is covered by grind stone jacket 35, and it is supplied, and emery wheel 22 is cooled. In addition, This supplied grinding fluid causes a companion rotation to emery wheel 22, and it is supplied to grinding point 8.

[0012]

And, Bezel 50 wished for is ground in work W by move board 21 and action of table 3. In addition, Creep feed grinding is done in the embodiment, but, because a grinding fluid is supplied by grinding fluid feed branch by both sides of right and left, even if it makes right and left go to table 3 and return, and round trip is ground, is supplied whether it is enough grinding fluid in grinding point without changing.

[0013]

In addition, If all the grinding fluid spouted out from grinding fluid fuel injection system 40 applies to emery wheel 22, and it suffers plumb, cutoff performance after the fashion of air can be raised.

[0014]

[EFFECT OF THE INVENTION]

According to the present invention, grinding point can be supplied with enough grinding fluid in bezel grinding of inner races of equal speed joint as had described as things mentioned above by supplying grinding fluid by grinding fluid feed branch from both sides of emery wheel, coolability is improved by leaps and bounds by it sookini and and grinding fluid * is shot, and it depends, and emery wheel is depended on by it makes grinding fluid spout out in elevated pressure, and intercepting air stream, and raising feed characteristics from grinding fluid feed branch. Therefore, improvement of durability of prevention of grinding burning or emery wheel more is possible. In addition, And round trip grinding is possible, and there is abbreviation of grinding time.

[BRIEF DESCRIPTION OF DRAWINGS]

[FIG. 1]

It is general drawing in recessing apparatus of the present invention.

[FIG. 2]

It is part cross section in recessing apparatus of the present invention.

[FIG. 3]

It is an explanatory drawing showing feed condition of grinding fluid in recessing apparatus of the present invention.

[FIG. 4]

It is an explanatory drawing showing grinding condition of recessing apparatus in before.

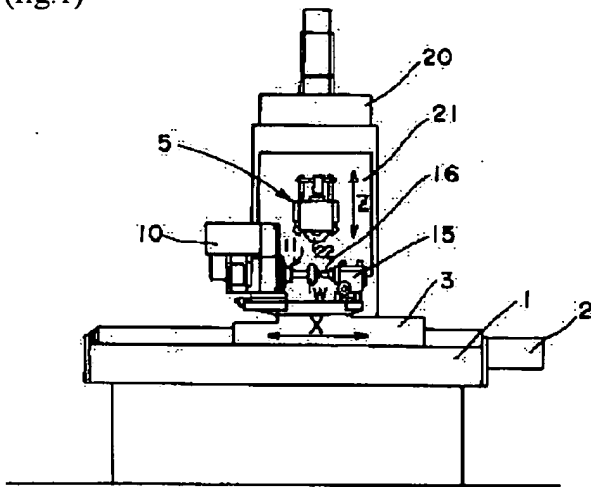
[FIG. 5]

It is an explanatory drawing showing condition when bezel is ground.

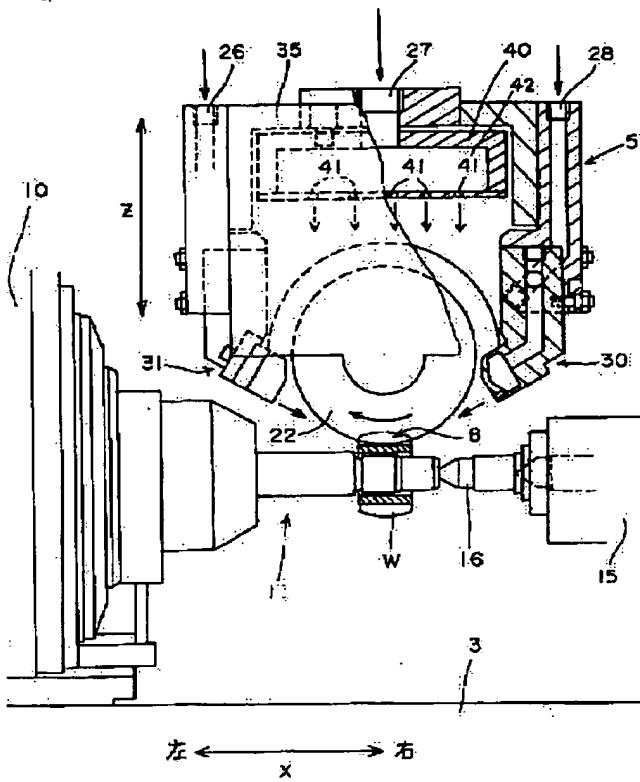
[DENOTATION OF REFERENCE NUMERALS]

1 Bed 3 Table 10 A milling head 11 A chuck 21 Move board 22 Emery wheel 30,31 Grinding fluid feed branch 35 Grind stone jacket 40 Grinding fluid fuel injection system

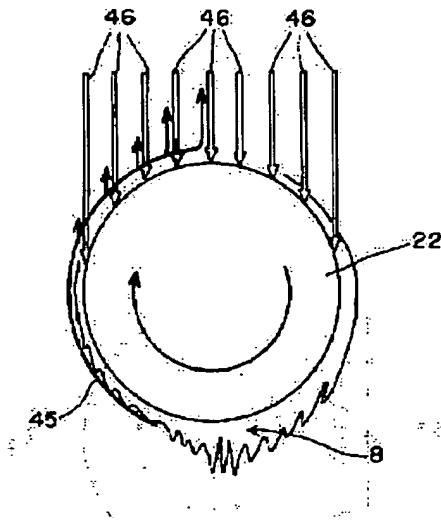
(fig.1)



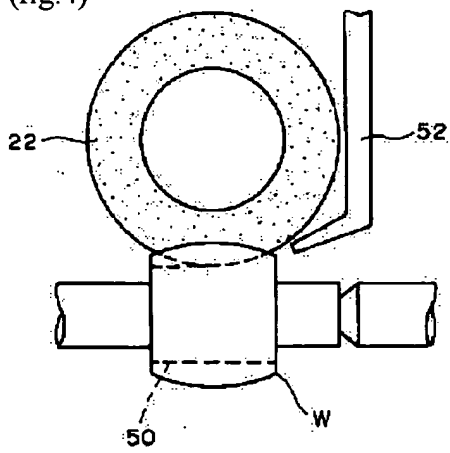
(fig.2)



(fig.3)



(fig.4)



(fig.5)

